L 24575-66
ACC NR: AP6009671

the obtained plots of the ultrasound absorption against the loading
it is concluded that securing of dislocations during the earlier
stages of the programmed loading is possible. At large degrees of
deformation, a maximum of ultrasound absorption is observed. The
results are interpreted from the point of view of the dislocation
theory of absorption developed by A. Granat and K. Lucke (J. Appl.
Phys. v. 28, 583, 1956). Orig. art. has: 3 figures, 5 formulas,
and 1 table.

SUB CODE: 20/ SUBM DATE: 28Jul65/ ORIG REF: 006/ OTH REF: 001

Card   3/3 BK

AUTHORS: Gindin, I. A.; Neklyudov, I. M.; Finkel', V. A.; Shubin, Yu. V.

ORG: Physico-technical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institute AN UkrSSR)

TITLE: Effects of programmed loading on the plasticity of beryllium monocrystals

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 5, 1966, 774-778

TOPIC TAGS: beryllium, metal property, metal crystal, crystal property, plasticity

ABSTRACT: The effects of preliminary programmed loading at 400C on the subsequent mechanical properties of beryllium monocrystals at room temperature were investigated. One set of specimens (99.6% pure) with base plane oriented at 45° to the loading axis) was loaded (0, 5, 6, and 10 kg/mm^2) and tested in compression. Another set (99.9% pure, base plane and $\langle 1010 \rangle$ direction coincided with loading axis) was loaded (0, 4.3, and 5 kg/mm^2) and tested in tension. It was found that the room temperature yield stress σ_s and relative compressibility ε were 9.6, 11.3, 11.0, and 9.8 kg/mm^2 and 10.7, 17.7, 24.7 and 11.2% respectively for the preloading conditions of the first set of specimens and 14.5, 16.1, and 12.4 kg/mm^2 and 29, 36, and 39.5% respectively for the second set. Elongation was 54, 53, and 64% respectively for the second set. X-ray diagrams of the preloaded monocrystals are also presented. Orig. art. has: 5 figures.

SUB CODE: 11, 13/ SUBM DATE: 31May65/ ORIG REF: 006/ OTH REF: 006

UDC: 539.37:546.45

Card 1/1 MCP

ACC NR: AP6033052   SOURCE CODE: UR/0126/66/022/002/0254/0261

AUTHOR: Gindin, I. A.; Starodubov, Ya. D.; Zakharov, V. I.

ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: Investigation of the effect of low-temperature deformation on the creep resistance of nickel and copper at high temperatures

SOURCE: Fizika i metallov i metallovedeniye, v. 22, no. 2, 1966, 254-261

TOPIC TAGS: nickel, creep, ~~resistance~~, copper, ~~creep resistance, nickel mechanothermal treatment, copper mechanothermal treatment~~ mechanical heat treatment, rupture strength

ABSTRACT: Specimens of oxygen-free copper (99.98%-pure) and vacuum-melted nickel (99.95%-pure), vacuum-annealed at 1050C (nickel) and 900C (copper) for 4 hr, were subjected to low temperature mechanothermal treatment (LMTT) stretched by 3.7% (nickel) or 8% (copper) at 4.2 and 300K, and "annealed" at room temperature for about 100 hr. The speci-mens were then tested for creep resistance at temperatures ranging from 500C to 1000C. It was found that LMTT improved considerably the rupture life of both metals. For instance (see Fig. 1), the rupture life of untreated nickel specimens at 800C under a stress of 1.3 kg/mm^2

Card 1/2   UDC: 548.0:539

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ACC NR: AP6033052
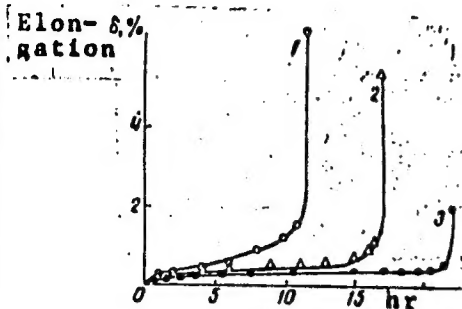
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gation

Fig. 1.   Primary creep curves of nickel at 800C under a stress of 1.3 kg/mm^2

1 - Untreated specimen; 2 and 3 - specimens stretched at 300 and 4.2K, respectively.

was 11.3 hr, the elongation was 6.5%; the rupture life of specimens deformed at 300 and 4.2K was 17 and 22 hr, and the elongation was 5.8 and 2.0%, respectively. The creep resistance of copper specimens was similarly affected by LMTT. The effect of LMTT on creep behavior is preserved at temperatures up to 1000C for nickel and up to 700—750C for copper. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 13, 11/   SUBM DATE: 10Aug65/   ORIG REF: 011/   OTH REF: 001

Card 2/2 nat

ACC NR: AP7004567   SOURCE CODE: UR/0126/66/021/004/0600/0607

AUTHOR: Gindin, I. A.; Godzhayev, V. M.; Lazarova, N. B.; Starodubov, Ya. D.

ORG: Physicotechnical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: Low-temperature creep of lithium in the region of polymorphous transformation

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 4, 1966, 600-607

TOPIC TAGS: creep, metal deformation

ABSTRACT: A study was made of creep in Li at 300, 180 and 77 K., encompassing the polymorphous transformation range. The electrical resistance of specimens during the creep process was measured. It is shown that for long-term low-temperature creep of Li, the creep curves show three stages, instantaneous deformation, a transitional stage and a stage of steady flow. At 77 K. the logarithmic rule of the transitional stage of creep is valid up to those values of stress at which polymorphous transition is absent or weakly defined. Creep curves of single-phase specimens at 300 K. even in the case of low stresses, do not comply with the logarithmic rule. A maximum of electrical resistance during creep at 77 K. was found which decreases in a steady pattern in specimens previously strained at 77 K. Orig. art. has: 8 figures.
[JPRS: 36,774]

SUB CODE: 20 / SUBM DATE: 09Mar65 / ORIG REF: 005 / OTH REF: 009

Card 1/1   UDC: 539.292:539.376
                                                 0926   1965

ACC NR: AP6022042   (A)   SOURCE CODE: UR/0120/66/000/003/0225/0226

AUTHOR: Gindin, I. A.; Starodubov, Ya. D.; Kravchenko, S. F.; Lazareva, M. B.

ORG: Physico-Technical Institute, AN UkrSSR, Khar'kov (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: A device for rolling metals at temperatures of 4.2-300°K

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 225-226

TOPIC TAGS: low temperature physics, low temperature metal, low temperature research, metal rolling

ABSTRACT: The device is used to measure the electrical resistance of deformed samples and for carrying out heat treatment in the temperature range from 4.2 to 1000°K. The basic characteristics of the setup are as follows: roller diameter--30 mm; operating length of the rollers--20 mm; rolling speed--1 and 10 mm/min; initial cross section of samples--from 3 to 5 mm^2 (depending on the material). The thickness of the foil obtained is on the order of ten microns. For example, for copper at 20°K, the thickness is 20-30 microns. Orig. art. has: 1 figure.

SUB CODE: 11,20,13/   SUBM DATE: 24Apr65/   ORIG REF: 002/   OTH REF: 002

UDC: 621.59:621.771

Card 1/1

ACC NR: AP7001543

SOURCE CODE: UR/0020/66/171/003/0552/0554

AUTHOR: Gindin, I. A.; Starodubov, Ya. D.; Lazareva, M. B.; Lazarev, B. G.
(Academician AN UkrSSR)

ORG: Physicotechnical Institute Academy of Sciences UkrSSR (Fiziko-tekhnicheskiy institut Akademii Nauk UkrSSR)

TITLE: Low-temperature recrystallization of copper rolled at 77 and 20K

TOPIC TAGS: copper, low temperature deformation, metal/deformation, copper metal recrystallization, recrystallization temperature, recrystallization activation energy, metal rolling, grain size, metal physical property

ABSTRACT: Specimens of 99.98%-pure copper with an initial grain size of 100 μ were rolled at 293, 77, and 20K with a 10% reduction per pass and a total reduction of 90%. The specimens were rolled at a speed of 10 mm/min and immediately annealed at 293—468K. X-ray diffraction pattern examination showed that low-temperature deformation decreased the grain size, produced noticeable microdistortion in the lattice, and significantly reduced the temperature of the beginning of recrystalliza-tion. Copper deformed with a 90% reduction recrystallized even at room temperature. The lower the deformation temperature, the sooner the recrystallization begins. For instance, in copper rolled at 20K the recrystallization begins after 19 hr, while in copper rolled at 77K—after 2.5 month. With decreasing deformation tempera-

Card 1/2

UDC: 539.2

ACC NR: AP7001543

ture from 293 to 20K, the activation energy was found to decrease from 33 to 18 kcal/g-atom. This fact, and also the lowering of the recrystallization temperature, is caused by an increase in the latent deformation energy and by a higher metastability of the crystalline body. The low-temperature recrystallization makes it possible to investigate the metal recrystallization, taking into account the temperature conditions of the activation work straining, and to develop metal structures with special physical properties. V. V. Kozinets and M. P. Starolat are thanked for their assistance in the experiments. Orig. art. has: 2 figures.

SUB CODE:11,2012/SUBM DATE: 15Jul66/ ORIG REF: 008

Card 2/2

ACC NR: AP7005206   SOURCE CODE: UR/0185/66/011/011/1243/1246

AUTHOR: Hindin, Y. A.--Gindin, I. A.; Malik, H. M.--Malik, G. N.; Nechvolod, M. K.--
Nechvolod, N. K; Starodubov, Ya. D.

ORG: Physicotechnical Institute AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR);
Pedagogical Institute, Khar'kov (Pedagogicheskiy institut)

TITLE: Effect of ultrasonic irradiation on the creep of LiF single crystals, II.

TOPIC TAGS: lithium fluoride, creep, ultrasonic irradiation, crystal dislocation
phenomenon, plastic deformation, crystal defect

ABSTRACT: Part I is published in the same issue as part II, which reports an investi-
gation of the influence of prior low-intensity ultrasonic irradiation on the creep of
single crystals of LiF to which the load was applied in steps, and the influence on
the change in the dislocation structure. The investigations were made on single
crystals measur ing 1.5 x 2 x 5 mm having a dislocation density $6 \times 10^4 - 1 \times 10^5$
cm^{-2}. The method of preparing the samples and their etching are described in part I.
The creep tests were made under uniaxial compression and under identical conditions.
The results show that prior irradiation weakens the samples, leading to an increase
in the plastic deformation and to an increase in the creep rate. Prior ultrasonic
irradiation also contributes to the lowering of the stress required for the transi-
tion from the deformation damping stage to the stage where the deformation increases

Card   1/2

ACC NR: AP7005206

rapidly under stepwise creep conditions. The results are interpreted from the point of view that the ultrasound lowers the potential barrier for the motion of the dis- locations in the crystal and facilitates their motion. It is also possible that point defects are produced under the influence of the ultrasound. Orig. art. has: 5 figures.

SUB CODE: 20, 11/   SUBM DATE: 31Jan66/   ORIG REF: 004/   OTH REF: 008

Card 2/2

KUPERMAN, Yakov Mironovich, kand.ekon.nauk; YAKUSHEV, Pavel Mikhaylo-
vich. Prinimal uchastiye: GINDIN, I.P., kand.ekon.nauk;
BIRMAN, A.M., kand.ekon.nauk, red.; KUTSENOVA, A.A., red.izd-va;
EL'KINA, E.M., tekhn.red.; GILENSON, P.G., tekhn.red.

[Working capital of construction organizations] Oborotnye
sredstva stroitel'nykh organizatsii. Moskva, Gos.izd-vo lit-ry
po stroit., arkhit. i stroit.materialam, 1959. 159 p.
                                     (MIRA 12:8)

(Construction industry--Finance)

GINDLIN, I.M., inzh.

New cold storage distribution warehouses of the Kazakhstan S.S.R.
Khol.tekh. 40 no.5:4-7 S-O '63.   (MIRA 16:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut kholodil'noy
promyshlennosti.

GINDIN, I.S., tekhnik-tekhnolog; ANDREYEV, V.M., prof., otv.red.;
POSTERNYAK, Ye.F., inzh., red.; FREGER, D.P., tekhn.red.

[Swivel carriage for cutting screw threads on turret lathes]
Povorotnyi support dlia narezaniia rez'by na revol'vernykh
stankakh. Leningrad, 1954. 5 p. (Informatsionno-tekhnicheskii
listok, no.6(579)).   (MIRA 14:6)

1. Leningradskiy Dom nauchno-tekhnicheskoy propagandy. 2. Lenin-
gradskiy Dom nauchno-tekhnicheskoy propagandy (for Posternyak).
          (Lathes--Attachments)

PROCESSES AND PROPERTIES INDEX

*Investigation of the Corrosion of Metals by Non-Electrolytes. I. The Action of Light Hydrocarbon Fuels on Metals and Alloys. L. G. Gindin and R. S. Ambarzumjan (*Izvestia Akademii Nauk S.S.S.R.* (*Bull. Acad. Sci. U.R.S.S.*), 1946, [vii], (10), 1385-1397).—[In Russian.] The action of petrol was investigated on aluminium (Si 0·23, Fe 0·32%), Duralumin (Cu 3·74, Si 0·2, Fe 0·43, Mg 0·94%), alloy No. 11 (Mg 3·15, Mn 1·0, Fe 0·20, Si 0·17%, remainder Al), American alloy (Cu 7·41, Si 0·08, Fe 0·27%, remainder Al), magnesium (traces Si; 0·12% Fe), zinc (Fe 0·19, Cu 0·00, Pb 1·0%), copper (traces of Bi and Sb), brass (38·88% Zn), bronze (10% Sn), carbon steel, and stainless steel. It may be assumed that aviation petrol does not affect the above metals and alloys, even after being saturated with water at 14° C.

N. A.

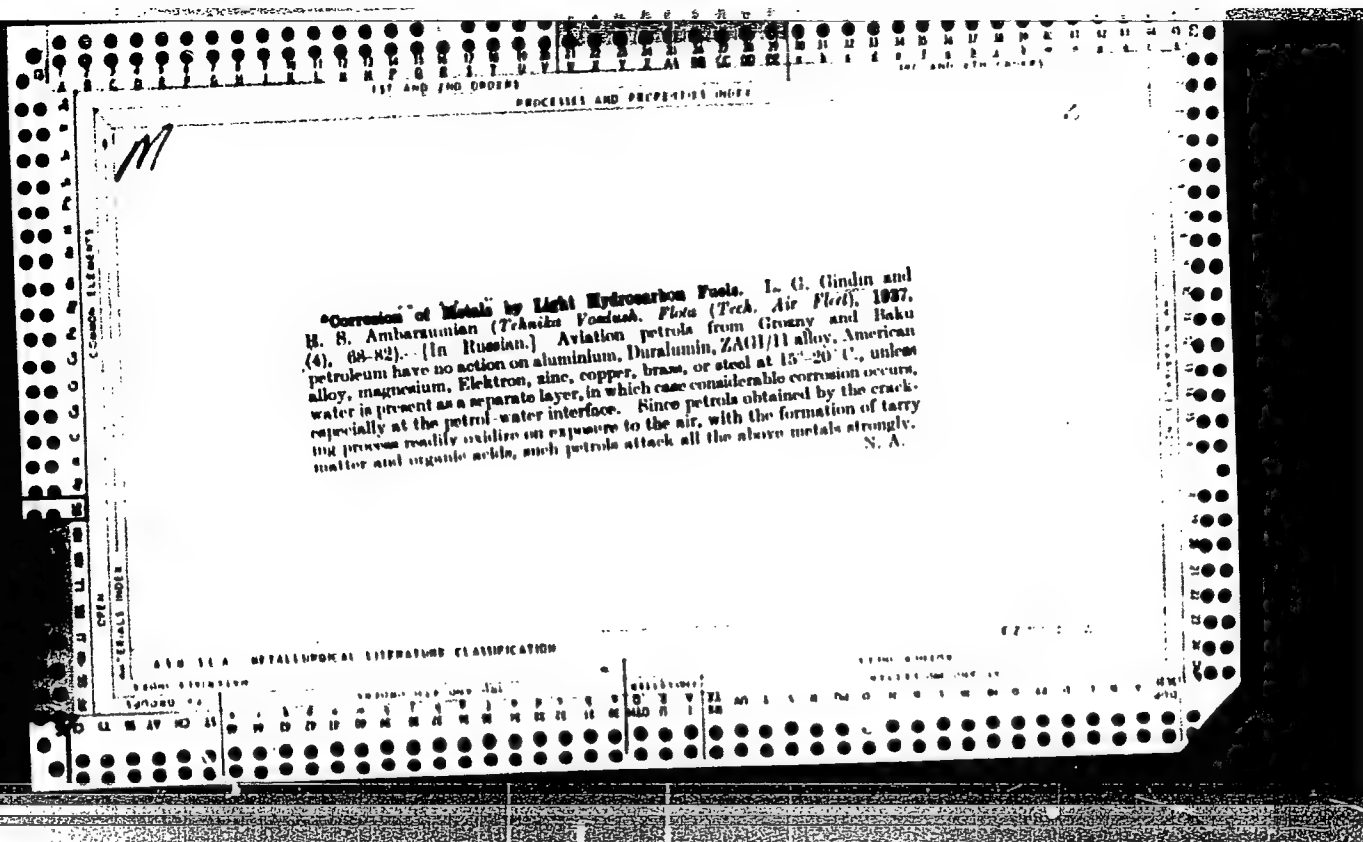A.S.D.–I.L.A.　METALLURGICAL LITERATURE CLASSIFICATION

ca

7

Investigation of corrosion of metals by nonelectrolytes.
II. Action of cracked benzines on zinc. L. G. Gindin,
I. I. Toruev and R. S. Amiartzumyan. *Bull. acad. sci.
U. R. S. S., Classe sci. math. nat., Ser. chim.* 1938, 78-96
(in German 88-91): cf. C. A. 30, 5169⁹. - The assumption
that the aggressiveness of cracked benzines in causing
corrosion of metals is due to their autoxidation is proven
experimentally by subjecting weighed specimens of Zn
plates to the action of Grozneny and Bakin cracked ben-
zines for varying periods of time (up to 770 days). From
the exptl. results it is established that the intensity of cor-
rosion of Zn is a function of the acidity and amt. of tars
present in the benzines. Under certain conditions, a
"passive" film, probably composed of Zn and org. compds.,
forms on the Zn surface and protects it from further de-
compn.   Eighteen references.   John Livak

A S b - S L A   METALLURGICAL LITERATURE CLASSIFICATION

Autoxidation of unsaturated hydrocarbons. P. Panyutin, L. Hindin and O. Vasil'eva. *Compt. rend. acad. sci. U. R. S. S.* [N. S.], 2, 183-6(1936)(in German).—To 2.5 ml. of the substance to be tested, e. g., benzine, add exactly 25 ml. of 4% KI in KtOH and 0.5 ml. of pure, concd. H_2SO_4. Allow the mixt. to stand 4 hrs. in the dark in a stoppered bottle. At the same time start a blank expt. with the same quantities of reagents and 5 ml. of distd. benzine which is known to contain no unsatd. compds. After the specified time has elapsed, titrate the I_2 in the blank test with $Na_2S_2O_3$. In the main expt. titrate the excess KI after oxidation with ferric alum soln. To accomplish this, ext. the soln. in the main test with two 50-ml. portions of water. Dil. the aq. ext. to exactly 250 ml. and take a 50-ml. aliquot. Transfer this to a 200-ml. round-bottomed flask carrying a glass stopper which is fitted with a glass delivery tube. Add 5 ml. of 25% H_2SO_4, 2 g. of ferric alum and 2-3 pieces of calcite. Slowly heat the contents of the flask and pass the escaping gas into 100 ml. of 10% KI soln. which is kept cold with ice. Finally titrate the I_2 in the receiver with $Na_2S_2O_3$. In exactly the same way, treat 25 ml. of the KI soln. with ferric alum and det. the original I content. The peroxide no., expressed in g. I which would be used up by 100 g. of the substance analyzed, can be obtained by the formula. peroxide no. $= [a - 5(b - c) - e]\,T.100/n.d.$, where $a =$ ml. $Na_2S_2O_3$ required for titrating the I_2 originally present in the KI soln., $b =$ ml. $Na_2S_2O_3$ required in titrating the distd. I_2, $c =$ ml. $Na_2S_2O_3$ required in the blank, $T =$ titer of the $Na_2S_2O_3$ in terms of I, $n =$ ml. of sample taken and d, its d. If it is desired to express the peroxide no. in terms of gram-equiv. of active O, as is usual, then the titer of the soln. should be in terms of O. W. T. H.

B-I-4

PROCESSES AND PROPERTIES INDEX

Behaviour towards metals of solutions of sulphur and a range of organic sulphur compounds in saturated hydrocarbons. L. G. Gindin, I. I. Tomufev, and V. A. Karakova (Compt. rend. Acad. Sci. U.R.S.S., 1936, 3, 219—223; cf. B., 1936, 666).—The rôle of S compounds in the corrosion of metals by fuel oils is discussed. Solutions of S in C_6H_{12} (free from S compounds) had no action on steel and Pb during 16 months at room temp., but formed CuS on Cu.   R. C. M.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Corrosion of Metals by Light Hydrocarbon Fuels. L. G. Gindin and B. S. Ambartsumian (*Tekhnika Vozdush. Flota* (*Tech. Air Fleet*), 1937, (4), 68–82). [In Russian.] Aviation petrols from Grozny and Baku petroleum have no action on aluminium, Duralumin, ZA(I)/11 alloy, American alloy, magnesium, Elektron, zinc, copper, brass, or steel at 15°–20° C., unless water is present as a separate layer, in which case considerable corrosion occurs, especially at the petrol-water interface. Since petrols obtained by the cracking process readily oxidize on exposure to the air, with the formation of tarry matter and organic acids, such petrols attack all the above metals strongly.

N. A.

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

BC

R-1

Linear corrosion of metals. I. Selective corrosion of metals on three-phase boundaries. L. G. Gomar, D. I. Rosen, and F. M. Schmuraxin (J. Phys. Chem. Res., 1937, 9, 64—69).—The corrosion of Cu by aq. NH_3, of Fe by H_2SO_4, and of Mg by HCO_2H and AcOH occurs strongly on the three-phase boundary, metal-paraffin-corrosive liquid, causing the formation of deep rills around a paraffin spot on the metal surface. This linear corrosion is sometimes a periodic process. The linear corrosion on the phase boundary does not depend on surface activity of the corroding liquid and is not affected by addition of surface-active substances.   E. R.

A.S.M.—S.L.A.   METALLURGICAL LITERATURE CLASSIFICATION

B-I-4

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Corrosion of metals by nonelectrolytes. Influence of light hydrocarbon fuel on metals and alloys. IV. Action of cracked gasoline on steels. L. G. Gindin and R. S. Ambartsumyan. J. Phys. Chem. (U.S.S.R.) 9, 215-21 (1937); cf. C.A. 31, 4252. C steel at 20° C is strongly corroded by cracked gasoline in 500-700 days at room temp. Corrosion is coupled with autoxidation of the gasoline. Stainless (Cr-Ni) steel remains unattacked after 400 days. V. Action of cracked gasoline on copper and brass. Ibid. 222-30. Cu is strongly corroded by cracked gasoline in 600 days at room temp.; the losses in wt. are up to 2.5 g. per 100 g. Corrosion is due to autoxidation of the gasoline. No autoxidation or corrosion occurs in presence of α- or β-pinene (30 drops per l.) Brass is strongly corroded by gasoline from Baku, but only slightly by that from Grozny. The corrosion of brass is assocd. with a dezincification.   B. C. A.

MSB-11-A   METALLURGICAL LITERATURE CLASSIFICATION

"Metal Corrosion by Non-Electrolytes. Influence of Light Hydrocarbon Fuels on Metals and Alloys. V.—Action of Cracked Petrols on Copper and Brass. L. G. Gindin, and R. B. Ambarzumian (Zhur. Fizich. Khimii (J. Phys. Chem.), 1937, 9, (2), 222-230).—[In Russian.] Copper is strongly attacked by oxidized cracked petrol, and the action is controlled by the rate of autoxidation of the petrol and by the corrosion products. The actual loss in weight of the metal depends on the changes which occur in the composition of the oil; the results obtained with petrol derived from Baku oil differ from those obtained with petrol from Grozny oil. Both petrols attack β and α + β brass, producing dezincification.—N. A.

A S B · S L A   METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

A - 1

Linear corrosion of metals. Selective corrosion of iron by the system water-sulphuric acid-propyl alcohol on three-phase boundaries. L. Grivos and F. Sommariva (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 409—412; cf. A., 1937, I, 319).—The corrosion of Fe, partly covered with paraffin, in $H_2O-H_2SO_4-PrOH$ mixtures has been investigated. Concn. ranges which yield linear attack at the air–liquid and liquid–paraffin interfaces, periodic formation of films of corrosion product, and resinification of the PrOH are distinguished.   J. W. S.

METALLURGICAL LITERATURE CLASSIFICATION

Relation to metals of sulphur solutions and of a series of organic sulphur compounds in saturated hydrocarbons. Relations to iron of ethyl and butyl mercaptan solutions in cyclohexane. L. G. Gixnix, L. I. Torsujev, and V. A. Kazakova (Compt. rend. Acad. Sci. U.R.S.S., 1937, 16, 413—418).— Fe is unaffected by solutions of EtSH and BuSH in cyclohexane. It is confirmed that the lamp method is satisfactory for determination of S in oils.

J. W. S.

7

Research on autoxidation of unsaturated hydrocarbons. I. Determination of peroxides in the presence of unsaturated compounds. P. S. Panyutin and L. G. Gindin. *Bull. acad. sci. U. R. S. S., Classe sci. math. nal., Sér. chim.* 1938, 841-53(in English, 853-4).—The method depends upon treatment of the sample with 4% KI in alc. in the presence of H_2SO_4. The excess KI is extd. with water, oxidized by ferric alum soln. The liberated I_2 is absorbed in KI soln. and titrated with $Na_2S_2O_3$. The method is suitable for detg. peroxide in gasoline.
                                                    J. G. Tolpin
Seventeen references.

METALLURGICAL LITERATURE CLASSIFICATION

Oxidation of alkyl anthracenes, alkyl anthraquinones and their derivatives. I. Oxidation with chromic anhydride of β-methylanthraquinone to anthraquinone-β-carboxylic acid. M. A. Il'inskii and V. A. Kazakova. Compt. rend. acad. sci. U. R. S. S. 20, 555 8 (1938) (In English).—A method of oxidation of β-methyl-anthraquinone (I), giving 96% of anthraquinone-β-carboxylic acid (II), has been developed by the following procedure: To 1 g. I in 50 ml. warm glacial AcOH was added gradually 3 g. finely ground anhyd. CrO₃, with vigorous stirring; the mixt. was warmed to 70° and held there for 8 hrs.; the contents were cooled, dild. with 400 ml. H₂O, and the ppt. filtered, washed with H₂O, boiled with dil. NH₃ soln. till the filtrate no longer gave a ppt upon acidification; the soln. of the NH₃ salt of II was filtered and the filtrate acidified with HCl, giving II, m. 291-2°. The highest yields were obtained with anhyd. AcOH and CrO₃. II. Oxidation of β-methylanthraquinone with chromic anhydride to anthraquinone-β-carboxylic acid as influenced by water. Ibid. 559 40. Using the above oxidation conditions, the inhibiting action of H₂O was detd. The yield of anthraquinone-β-carboxylic acid was decreased with increase in the amt. of H₂O added. The results are tabulated.   I. F. I.

Investigations of the corrosion of metals by nonelectrolytes. The action of light hydrocarbon fuel on metals and alloys. VI. The action of cracked gasoline on lead. L. G. Gindin. Compt. rend. cond. sci. U. R. S. S. 20, 561-4(1938)(in English); cf. C. A. 33, 3004².—When autoxidation occurs in Baku and Grozny cracked gasolines, contg. metallic Pb, the Pb is strongly corroded. With the Baku material, 13.2 g. of Pb is attacked after 710 days in 100 cc. of the gasoline. Analysis shows that about 60% of the corrosion product is $PbCO_3$. It is suggested that org. acids formed on autoxidation first attack the Pb, then CO_2 displaces part of the org. acid in the Pb salt. George Ayers

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Kinetics of the polymerization of 2-chloro-1,3-butadiene catalyzed by benzoyl peroxide in dibutyl phthalate solutions. S. S. Medvedev, L. Gladin and M. Lazareva. J. Phys. Chem. (U. S. S. R.) 13, 1380-1402(1939).— The kinetics of the polymerization of chloroprene (I) and the distribution of I in the gas and liquid phases were detd.

by a manometric method. The soly. of I in dibutyl phthalate is given by $P/C = K$ with $n = 0.730$, $K = 2.15$ at 30°; $n = 0.822$, $K = 3.93$ at 60°. The polymerization process is heterogeneous; the rate increases with increasing concn. of I and benzoyl peroxide (II) only up to a certain max. and then remains const. This max. is greater the greater the surface available, varying from 2 to 8% II. With 4% II, the energy of activation between 30 and 60° is 12.5 Cal. On the basis of an analysis of the kinetic data, it is concluded that the initial active centers form as the result of reaction between I and ionized II radicals adsorbed on the walls. These reaction nuclei then leave the wall and the polymerization process takes place in the soln. vol. Deactivation may occur either by reaction with un-ionised II or by collision with adsorbed mols. of I.   F. H. Rathmann

20

Corrosion of Metals by Non-Aqueous Solutions. The Action of Ethyl Alcohol on Metals. L. G. Gindin, R. S. Ambarzumian and E. P. Belchikova. (Comptes Rendus (Doklady) de l'Académie des Sciences de l'U.R.S.S., 1940, vol. 29, Oct. 10, pp. 44–47). This is the introductory paper to a projected series on the corrosion of metals in non-aqueous electrolytes, mainly alcohols and alcoholic solutions. The authors review the literature on the effect of ethyl alcohol on metals, and they describe the procedure they adopted for the purification of the ethyl alcohol used for their investigation. In the series of experiments described in the present paper, the tests were carried out in sealed glass tubes in an apparatus which is illustrated, and tables are given of the results obtained after keeping samples of magnesium, aluminium, zinc and steel (carbon 0·28%, manganese 0·51% and silicon 0·22%) for 210 days under absolute alcohol and for 150 days under 99·7% alcohol. Only magnesium proved to be slightly corroded by ethyl alcohol under the experimental conditions described, whereas the three other materials examined were not affected at all.

Corrosion of Metals by Non-Aqueous Solutions. R. S. Ambarzumian, L. G. Gladin and E. P. Belchikova. (Comptes Rendus (Doklady) de l'Académie des Sciences de l'U.R.S.S., 1940, vol. 29, Oct. 20, pp. 91–94). The authors studied the influence of carbon dioxide on the action of ethyl alcohol on magnesium, aluminium and steel. They used alcohol saturated with carbon dioxide, and the experimental procedure was as described in the first paper of the series (see preceding abstract). They found that in the presence of carbon dioxide, steel and aluminium are also not corroded by ethyl alcohol, whereas the corrosion of magnesium is considerably enhanced.

Corrosion of metals by nonaqueous solutions. Iv. G. Gindin, R. S. Ambartsumyan and E. P. Bel'chikova. Compt. rend. acad. sci. U. R. S. S. 29, 348 (1940) (in English). — The inactivity of EtOH on metals was examd. with respect to the possible presence of "autoinhibitors," such as aldehydes or fusel oils. Two metals Mg and Electron metal (I) were tested as described in previous expts. for a period of 130 days at 20° in 96.4% alc. free from aldehydes and fusel oil, and in the same alc. to which was added separately, 0.1% of formaldehyde, acetaldehyde, paraldehyde and benzaldehyde. The addn. of formaldehyde and acetaldehyde produced no inhibition. Paraldehyde inhibited completely the corrosion of Mg and greatly decreased that of I. Benzaldehyde decreased the corrosion of I by a factor of 3. Expt. showed, however, that in alc. with CO₂, none of the above aldehydes was effective in reducing the corrosion.

T. K.

The mechanism of the simultaneous polymerization of butadiene with vinyl cyanide and 1-methylvinyl cyanide under the action of benzoyl peroxide. L. Gindin, A. Abkin, and S. Medvedev (Karpov Inst. Phys. Chem., Moscow). *J. Phys. Chem.* (U.S.S.R.) 21, 1209–87 (1947)(in Russian).—Mixts. of butadiene (I) (x wt. %) with CH_2:CHCN (II) (100 − x %) or CH_2:CMcCN (III) (100 − x %) and (Bz_2O)₂ (y%) were prepd. in N, heated 2 hrs., and distd. at room temp. in a high vacuum 2) hrs. The distn. residue (= polymer) was analyzed for N (i.e. nitrile) and active O (i.e. Bz_2O_2). For the detn. of active O the polymer must be dissolved in $CHCl_3$, not in acetone. The rate v of formation of polymer decreases when x increases; e.g. at 60° for the system I + II (y being 0.6%) the initial rate is 0.26% per hr. at x = 90% and 8.2% per hr. at x = 20%. During one expt. v is almost const. at small x and increases with time at large x. The v increases with temp.; e.g. 42% polymer is attained at 50° within 63 hrs. and at 70° within 11 hrs. The v is proportional to √y between y = 0.3 and y = 10 wt.%. These results are discussed from the viewpoint of Abkin and Medvedev, C.A. 34, 7700⁴. The polymerization ceases when one of the components is used up. The highest yield of polymer

(over 80%) is observed at x = 50% for the I + II and near x = 70% for the I + III system. The compn. of the polymer depends little on the time of polymerization and temp., but varies according to x. In the I + II system, the polymer contains more I than the original mixt. at x < 53% and less than the original mixt. at x > 53%. In the I + III system, the "azeotropic" mixt. has x = 60%. The concn. of (Bz_2O)₂ in the polymer decreases when x increases. However, polymerization continues also after this concn. becomes zero. Monomer, distd. from the polymer and again mixed with it, polymerizes at the same v as if no distn. occurred, but soln. and repptn. of polymer remove its catalytic activity. The compn. of a copolymer depends on the consts. α and β expressing the relative rates of reaction of 2 free radicals with the 2 components of the monomeric mixt. A simple method for computing α and β from exptl. data is shown. From the values for α and β the distribution of monomer groups within the copolymer can be calcd. (cf. C.A. 42, 8046). In the copolymer I + II, 67% II is present as one nitrile group between 2 butadiene groups; and in I + III 80% III is in this alternate pattern. The cessation of polymerization when 1 of the components is used up shows that both components are needed for the branching of the reaction chain.

J. J. Bikerman

GINDIN, L. G.

PA 35/49167

USSR/Metals
    Copper
    Corrosion

Dec 48

"Dok Ak Nauk SSSR" Vol LXIII, No 6

"Anthraquinone Protection of Copper From Corrosion
by Sulfur Solutions," L. G. Gindin, R. Kh. Sill's,
All-Union Inst Avn Materials, 4 pp

Shows that anthraquinone lengthens period of "in-
cubation," which precedes beginning of corrosion,
by 500,000 times. Table shows effect of anthraquinone
on corrosion of copper by sulfur solutions. Decides
that anthraquinone cannot, properly be called an in-
hibitor, or its effect be called inhibition since it
                                                35/49167

USSR/Metals (Contd)   Dec 48

does not slow the reaction but rather moves back its
beginning, or "immunizes" the metal. Submitted by
Acad A. N. Frumkin, 3 Nov 48.

35/49167

Polymerization of allyl acrylate   I   Determination of the structure and molecular weight of the soluble forms of polyallyl acrylate. L. Gindin, S. Medvedev, and E. Fleshler. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 19, 1094-1701(1949). — Polymerization of allyl acrylate, b_{20} 119.5-21.5°, n_D^{20} 1.4330, d_4^{20} 0.888 (?), in 2.5 and 5.7% solns. in C₆H₆ with 1% Bz₂O₂ catalyst at 60° gives low mol. prod ucts, sol. in org. solvents, with the main chain linkage formed substantially from the "acrylic" double bond. The process, followed dilatometrically to 80% polymerization, gave 35.0% total unsatn. of the product, which was al most identical with the "allyl" unsatn. (by the bromide-bromate method in CCl₄-AcOH); the total unsatn. was detd. by the bromide-bromate method in the presence of HgSO₄; the procedures were successfully tested on the monomer.   G. M. Kosolapoff

GINDIN, L. G.   PA 26/49T80

USSR/Metals   Jan 49
   Copper
   Corrosion - Prevention

"The Mechanism for Protecting Copper by
Anthraquinone From Corrosion in Sulfur Solutions,"
Ya. I. Frenkel', Corr Mem, Acad Sci USSR, L. G.
Gindin, All-Union Inst of Avn Materials, 3 pp

"Dok Ak Nauk SSSR" Vol LXIV, No 1

Attempts to determine exactly why a certain
quantity of sulfur molecules cannot penetrate
an impregnated, monomolecular film of
anthraquinone on a copper surface. Submitted
3 Nov 48.

                                             26/49T80

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*The Corrosion of Metals by Solutions of Iodine in Hydrocarbons. L. G. Gindin and M. V. Pavlova (Doklady Akad. Nauk S.S.S.R., 1948, 59, (3), 377–380).—[In Russian]. The corrosion of Cu, Pb, and Fe by soln. of I in benzene and iso-octane was studied. The required weight of I, many times resublimed, was put into a glass vessel, and the hydrocarbon was distilled, dried with Na, and added to the I. The strength of the I soln. was determined by titration. A strip of the metal of dimensions 8 × 20 × 60 mm. was left in contact with the soln. and the I and metal losses were determined. The nature of the corrosion products was also investigated. The rate of corrosion of Cu by a benzene soln. of I was up to 1 g./cm.²/hr., the corrosion product being CuI. In all experiments the actual loss of I from the soln. was less than it would have been if all the Cu lost from the strip had been converted into CuI; the same discrepancy was observed in the case of Pb. It was concluded that some of the Cu had combined with O. The corrosion products took the form of thin layers on the specimen, which separated and deformed when dried. Soln. of I in iso-octane acted similarly on Cu, but as the solubility of I in iso-octane is small, only dil. soln. could be used. The corrosion product of the benzene soln. on Pb was PbI₂; the iso-octane soln. acted more vigorously, giving the same corrosion product. The results for Fe were explained by assuming that the primary corrosion product decomposed with time into I and Fe₃O₄. Analytical and X-ray methods showed that only 3–7% of the corrosion product was FeI₂. When Fe was sealed in a tube contg. de-oxygenated I soln. under an inert-gas atmosphere, the corrosion product after 10 months was pure FeI₂. Only in the presence of soln. contg. O did the corrosion product on Fe form a layer structure; this indicated that the layer structure was connected with the process FeI₂ → Fe₃O₄.—Z. S. R.

621.315.61 : 621.3.013.51 : 537.528

1767. **Formation of "bridges" in suspensions of conductors or semi-conductors in dielectrics. I. Conducting bridge formation of aluminium in vaseline oil.** L. G. GINDIN, YA. I. FRENKEL AND O. A. SHPANSKAYA. *J. Tech. Phys.*, U.S.S.R., **20**, 937–43 (Aug., 1950) *In Russian.*

An investigation of the behaviour in strong electric fields of low concentration suspensions of Al in vaseline oil. It was found that above a certain critical value of the field strength the electric breakdown of the suspension occurs, i.e. conversion from a dielectric to a metallic conductor, owing to formation of bridges of Al particles. The curve of the influence of E_{crit}, on dispersion of Al particles was almost a straight line. If for linear particle dimension λ, E_{crit}, $\sim 4\,000$ V/cm, size reduction to $\lambda/5$ brings E_{crit}, to 13 000 V/cm. The critical Al concentration in the oil at which bridge formation is possible rises with its dispersion. If for particle size λ the limiting concentration $\sim 0 \cdot 005\%$, it is $0 \cdot 05\%$ for $\lambda/5$. It is interesting that for $E > E_{crit}$ a weak ($0 \cdot 05\%$) concentration remains a dielectric. This is due to intense turbulence of suspension between electrodes. Variation of electrode distance from $0 \cdot 5$ to $3 \cdot 5$ mm does not alter E_{crit}. At distance $> 3 \cdot 5$ mm bridges were not completed. There is a certain "induction period." Detection of bridge formation is by fall of E from $\sim 4\,000$ V/cm to ~ 1 V/cm and interruption of particle movement.

B. F. KRAUS (R)

METALLURGICAL LITERATURE CLASSIFICATION

c1

Behavior of soap dispersions in liquid dielectrics in a constant electric field. I. N. Putilova, L. G. Gindin, and L. M. Moros. *Doklady Akad. Nauk S.S.S.R.* 71, 81–3(1950).—Formation of peculiar ribbon-shaped structures was observed in 0.1% dispersions of Ba or Zn stearate, and of Ba oleate, in aviation gasoline and in paraffin oil, in an elec. field of 7500 v./cm. between 2 Ag electrodes 0.6 mm. apart. The ribbons start at one electrode, then a fragment breaks away and attaches itself to the other electrode; the 2 fragments continue to grow until they become united. At the stage when the ribbons connect the electrodes, the elec. cond. of the dispersion is increased very considerably, which indicates that the soap ribbons possess a very high elec. cond. Structurally, the ribbons appear to be cryst.   N. Thon

Corrosion of Metals by Cracked Gasoline and Other Unsaturated Fuels. (In Russian.) L. G. Gmelin. Doklady Akademii Nauk SSSR (Reports of the Academy of Sciences of the USSR), new ser., v. 71, Mar. 11, 1950, p. 361-363.

Study of the above problem indicates that auto-oxidation is the cause of corrosion by the above substances. Data on corrosion of Zn, Cu, and Pb are charted. Methods of prevention are indicated.

GINDIN, L. G.

PA 165T102

USSR/Physics - Dielectrics   1 Jun 50
                  New Techniques

"Electric Rupture of Metal Suspensions in Liquid Di-
electrics," L. G. Gindin, L. M. Moroz, I. N. Puti-
lova, Ya. I. Frenkel', Corr Mem, Acad Sci USSR, O. A.
Shpanskaya

"Dok Ak Nauk SSSR" Vol LXXII, No 4, pp 671-674

Describes apparatus used in actual studies of subject
rupture. Gives purely phenomenological (gross macro-
scopic) description of phenomenon of rupture in metal
suspensions. Theoretical analysis will appear later.
Suspensions of aluminum powder in gasoline, vaseline,
oil, etc., were mainly used, varying in metallic con-
tent from 0.005 to 1% (usually 0.1%). Submitted 5 Apr 50.
                                                165T102

C.A.

The electrochemical nature of the corrosion of metals in liquid dielectrics. L. G. Gindin. *Doklady Akad. Nauk S.S.S.R.* **73**, 515-18(1950).—In a 1.5 N soln. of AcOH in —isooctane, of sp. elec. concd. $\sigma = 3.3 \times 10^{-14}$ ohm^{-1} cm^{-1} under 30 kv./cm., a Mg-Fe couple shows acetate spots on the Fe spreading from its middle but stopping at a distance of ~0.2 mm. from the Fe/Mg boundary. The Mg is corroded particularly along the boundary with Fe. This corrosion pattern, wherein the periphery of the Fe is protected by the contact with Mg, indicates clearly its electrochem. nature. This is confirmed by the potential distribution, mapped under a microscope, and showing a steep fall from the Mg to the Fe potential within a narrow boundary strip about 0.5 mm. wide. Consequently, in the dielec. soln., Fe and Mg form a cell in which Mg is anodic to Fe. That these electrochem. boundary effects, observed with macrocouples, must be even much more intense with microcouples, follows from the observation that the zone of strong corrosion of Mg spreads and increases with decreasing dimensions of the electrodes. In a Fe-Mg microcouple of a diam. of 10^4 A., with a gap of ~10 A. between the 2 metals, the elec. field E in the gap is ~10^2 v./cm., and, on the surface

of the microcouple, 10^{-3} to 10^{-4} v./cm. On account of the proportionality between log σ and $\sqrt{E}$, this field gives rise to a sufficiently high elec. cond. around the microcouple to set up a galvanic cell.   N. Thon

PA 174T56

GINDIN, L. G.

USSR/Physics - Dielectrics   1 Sep 50

"Mechanism Governing the Electric Rupture of Me-
tal Suspensions in Liquid Dielectrics," Ya. I.
Frenkel', Corr Mem, Acad Sci USSR, L. G. Gindin,
L. M. Moroz, I. N. Putilova

"Dok Ak Nauk SSSR" Vol LXXIV, No 1, pp 49-52

Expt indicate that crit rupture voltage E_c is
several 1,000 v/cm, e.g., about 4,000 v/cm for
Al particles 3-5 microns. Submitted 21 Jun 50.

174T56

S

21

PROCESSES AND PROPERTIES INDEX

Heat-Treatment of Twinned Iron Crystals. R. I. Garber, I. A. Gindin, M. G. Konstantinowskii, and V. I. Startsev. (Doklady Akademii Nauk U.S.S.R., 1950, vol. 74, No. 2, pp. 343-346). [In Russian] The investigation of the influence of heat treatment on disappearance of twinned crystals of iron (caused by non-uniform deformation) is described. V. S.

METALLURGICAL LITERATURE CLASSIFICATION

GINDIN, L.G.

USA

A 53

537.528 : 621.3.013.51 : 621.315.61

6240.   Formation of "bridges" in suspensions of conductors or semiconductors in dielectrics. II. L. G. GINDIN, L. M. MOROZ, I. N. PUTILOVA AND YA. I. FRENKEL. *J. Tech. Phys., U.S.S.R.*, **21** (*No. 2*) 143–8 (1951) *In Russian*.

See Abstr. 3550 (1951) for part I.   The behaviour of a 0·1% suspension of Al in petrol in strong electric fields was investigated.   The process of bridge formation between the electrodes, which determines the final breakdown of the suspension, does not depend on shape, material or surface condition of the electrodes.   Viscosity and specific weight of the dispersing medium, whilst not influencing the critical or breakdown voltage of the field, E_{crit}, determines the duration of the formation time, or rate of formation, of the bridges and also their "life" after removal of the field. E_{crit} depends on the dielectric constant of the dispersing medium and on the duration of the preliminary application of the field.   The length of the obtainable bridges may be 3–4 cm, and even longer in more viscous media like vaseline oil.   The measured resistances of 25 bridges varied between 150 and 18 000 Ω, and the initial resistance value increases during the lifetime of the bridge, and may reach several MΩ.   Comparative values of E_{crit}: petrol ($\epsilon = 1·9$), 4 250; diethyl ether ($\epsilon = 4·5$), 4 000; chlorobenzene ($\epsilon = 5·94$), 2 250; nitrobenzene ($\epsilon = 36·5$), 1 750 V.   B. F. KRAUS

A.S.M.-S.L.A.   METALLURGICAL LITERATURE CLASSIFICATION

GINDIN L. G.

PA 149T102

USSR/Physics - Dielectrics   Aug

"Electric Conductivity of Liquid Dielectrics in Strong Fields," L. G. Gindin, Ya. I. Frenkel

"Zhur Tekh Fiz" Vol XXI, No 8, pp 986-993

Examd electric cond of hydrocarbon solns of iodine and acetic acid. It was shown that elec cond of these solns increases exponentially with potential of elec field, according to Frenkel's

eq $\sigma = \sigma_0 \exp \sqrt{\dfrac{-e^3 E/\varepsilon}{kT}}$, which was represented graphically as rectilinear relation between ln σ and $\sqrt{E}$. (cf. Ya. I. Frenkel, "Technical Physics of

USSR/Physics - Dielectrics (Contd)   Aug 51

USSR" 1937). Authors thank V. A. Kazakova and O. N. Shpanskaya for exptl research. Submitted 31 Jan 51.

194T102

GINDIN, L. G.

PA 193T27

USSR/Chemistry - Corrosion of Metals   Oct 51

"Corrosion of Metals by Hydrocarbon Solutions of.
Carboxylic Acids," L. G. Gindin, V. A. Kazakova

"Zhur Prik Khim" Vol XXIV, No 9, pp 958-969

Subsequent to series of investigations of corro-
sion processes arising in oxidized cracking gas-
oline, investigated corrosion of Mg, Fe, and Pb
by hydrocarbon (isooctane, benzene, and petr
ether) solns of acetic, propionic, n-valeric,
and n-caproic acids. Discusses variations of
corrosion in respect to different hydrocarbons
and acids. Character of salts formed in

USSR/Chemistry - Corrosion of Metals   Oct 51
              (Contd)

193T27

corrosion processes was found to depend on nature
of metal, properties of hydrocarbons, and mol wt
and concn of acids.

193T27

GINDIN, L.G.

PA 190T36

USSR/Chemisty - Corrosion   Oct 51

"Corrosion of Copper and Lead by Hydrocarbon Solutions of Iodine," L. G. Gindin, M. V. Pavlova

"Zhur Prik Khim" XXIV, No 10, pp 1026-1032

Benzene and iso-octane solns of iodine corrode copper and lead, converting the former to CuJ, the latter to PbJ$_2$. Iso-octane solns of iodine are more corrosive than benzene solns to lead, while both are equally aggressive in regard to copper.

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190T36

R

Asm

279-M. **Corrosion of Iron by Bensene Solutions of Iodine.** (In Russian.) L. G. Gindin and M. V. Pavlova. Zhurnal Prikladnoi Khimii, v. 24, Nov. 1951, p. 1151-1155. Laboratory tests; apparatus and method. It was found that FeI_2 is first formed and is then transformed to FeO_3 liberating the iodine for further attack. Data are tabulated. (H6, Fe)

GINDIN, L. G.

USSR/Chemistry - Corrosion;   21 Sep 51
                      Fuels

"Corrosion of Metals by Hydrocarbon Solutions of
Fatty Acids," L. G. Gindin, V. A. Kazakov

"Dok Ak Nauk SSSR" Vol LXXX, No 3, pp 389-392

Studies the action of benzene, isooctane, and pe-
troleum ether solns of acetic, propionic, butyric,
valeric and caproic acids on magnesium, iron, and
lead. The corrosive action of 0.5N solns of acetic
to caproic acids in isooctane increases with mol
wt but not evenly. The rate of corrosion depends
nonlinearly on the concn of the acid, and this de-
pendence varies from one metal to another, as illus-
trated by curves.   210T32

QINDIN L C

Influence of the Solvent on the Behaviour of Solutions of Acids Towards Metals [Copper and Iron]. L. G. Gindin, V. A. Kazakova, and I. N. Putilova (*Doklady Akad. Nauk S.S.S.R.*, 1951, **80**, (5), 777–780).—[In Russian]. Plates (2 × 20 × 60 mm.) of Fe and Cu were tested in 0·5N-soln. of butyric acid in water, benzene, isooctane, and vaseline oil, at room temp. in diffused light. The soln. were contained in thick-walled tubes with ground-in stoppers, but O was not excluded. The mean losses in weight of Fe in these soln. after 20 days were 0·0274, 0·4410, 0·0252, and 0·0228 g., resp. (0·0224 g. in pure distilled water); in 50-day tests, the mean losses for the Cu were 0·0514, 0·0519, 0·0326, and 0·0370 g., resp. These results do not support suggestions in the literature that the corrosion rate depends on the elect. conductivity (σ) of the soln.: for the aq. soln. $\sigma = 5·4 \times 10^{-4}$ ohm.$^{-1}$ cm.$^{-1}$, but for benzene or iso-octane soln. at $E = 30$ kV./cm., $\sigma < 2·1 \times 10^{-18}$ ohm.$^{-1}$ cm.$^{-1}$. This discrepancy cannot be explained by supposing that the corrosion is electrochem. in one soln. and purely chem. in the other (cf. G., Ambartsumyan, and Bel'chikova, *ibid.*, 1940, **29**, 45; G., *ibid.*, 1950, **73**, 515; 1950, **74**, 311); it indicates that the corrosion can be attributed to the homogeneous-electrochem. mechanism suggested by Frumkin (*Trudy 2-i Konf. po Korrozii Metallov*, 1940, **5**; Kolotyrkin and F., *Zhur. Fiz. Khim.*, 1941, **15**, 346; *M.A.*, **10**, 256). Since the corrosion rates in iso-octane and oil are almost the same despite the difference in viscosity, the kinetics of dissolution are not determined by diffusion. In experiments to find inhibitors, 1% chlorinated paraffin reduced the corrosion of Fe in the benzene soln. to 1/4·33 of its original value; 1·5% sulphurized stearic acid reduced the corrosion of Cu in the benzene soln. to 1/1·42 of the original value. In addn. to stimulating corrosion in aq. soln. of acids, nitrophenol and nitrobenzaldehyde cause a 2–2·5 times increase in the rate of corrosion of Fe in the benzene soln.—G. V. E. T.

GI'BIN, L. G.

"Electric conductivity of hydrocarbon solutions of iodine." (p. 1762)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1952, Vol. 22, No. 10

GINDIN, L. G.

Gindin, L. G., Kazakova, V. A.-   "Electric conductivity of hydrocarbon solutions
of saturated fatty acids." (p. 1767)

SO: Journal of General Chemistry, (Zhurnal Obshchei Khimii), 1952, Vol. 22, No. 10

GINDIN, L.G.

*The Electrochemical Character of the Corrosion of Metals in Hydrocarbon Solutions of Iodine. L. G. Gindin (Doklady Akad. Nauk S.S.S.R., 1952, 86, (4), 753-756).—[In Russian]. Cf. G. and Pavlova, ibid., 1949, 68, 377; M.A., 20, 1020; Zhur. Priklad Khim., 1951, 24, 1026, 1151; M.A., 22, 129. G. has investigated the corrosive action of the soln. by the method described previously (Doklady Akad. Nauk S.S.S.R., 1950, 74, 311), namely measurement of the current flowing between a cell of two metals. With Zn and Cu electrodes (20 × 20 × mm. 0·1-0·15 mm. from one another) in a 0·25N soln. of I in benzene, the Zn became the anode and the e.m.f. was 1·0-1·1 V. The current was initially very weak, but increased after 10-20 mm.; the internal resistance of the cell was ~100 MΩ at first, falling to ~0·1-0·01 MΩ. When 2·63 C had passed (determined by graphical integration of the current/time graph), the losses of Zn and Cu were 0·0037 and 0·0006 g., resp. (only the surface of the Zn facing the Cu was exposed to the soln.), i.e. the amount of electricity recorded is only 26·8% of that theoretically required for the loss of Zn. The additional loss is attributed to the action of microelements on the surface of the Zn. The Cu/Zn macrocell did not function in iso-octane soln. of I; brass, however, corrodes rapidly in both soln. Fe/Mg cells function in both benzol and iso-octane soln.; in a 0·02N iso-octane soln. the losses in weight were Mg (anode) 0·0031 g. and Fe 0·0010 g. for a flow of 24·6 C. This is only 2·8% of that theoretically required for the loss of Mg. The current from these cells (10⁻⁵-10⁻⁶ amp.) was relatively high, considering the elect. conductivity of the soln. (10⁻¹¹-10⁻¹² cm.⁻¹). Because of this, and of the relative inactivity in the first 10-20 min., G. explains the corrosion in terms of the formation between the electrodes of "bridges" of salts (in this case, iodides possessing ionic or mixed conductivity); the metal goes away from one electrode to another across these bridges and not through the poorly conducting soln. The sharp fluctuations in the current/time graphs are probably connected not so much with the polarization of the electrodes as with variations in the salt bridges. Corrosion of metals in these dielectrics, as in hydrocarbon soln. of fatty acids, is thus electrochem. in nature and not purely chem., as suggested by Kahlenberg (J. Phys. Chem., 1902, 6, 1).—G. V. E. T.

GINDIN, L. G.

Oct 52

USSR/Metallurgy - Corrosion, Immunizators

"On the Immunization of Metals Against Corrosion,"

L. G. Gindin and I. N. Putilova

"Dok Ak Nauk SSSR" Vol 86, No 5, pp 973-975

Defines immunizators as substances capable of delaying beginning of corrosion process on metals in hydrocarbon solutions, increasing, sometimes by thousands of times, induction period preceding evident beginning of corrosion. These substances were detected during search for corrosion inhibitors. Names several immunizators of copper, such as anthraquinone, aniline, triethanolamine, quinoline, benzyl alcohol, phthalimide, and others. Discusses application of immunizators for protection of steel in kerosene and analyzes difference in action of inhibitors and immunizators, suggesting coefficient for evaluating protective action of latter. Submitted by Acad P. A. Rebinder 28 Jun 52.

PA 245T26

245T26

245T26

PA 234T32

GINDIN, L.G.

USSR/Chemistry - Corrosion   21 Oct 52

"The Mechanism of Corrosion of Metals by Hydrocarbon
Solutions of Sulfur," L. G. Gindin, T. A. Miskinova

"Dok Ak Nauk SSSR" Vol 86, No 6, pp 1145, 1146

Finds that the corrosion of copper by 0.1% benzene
solns of sulfur is a purely chem process rather than
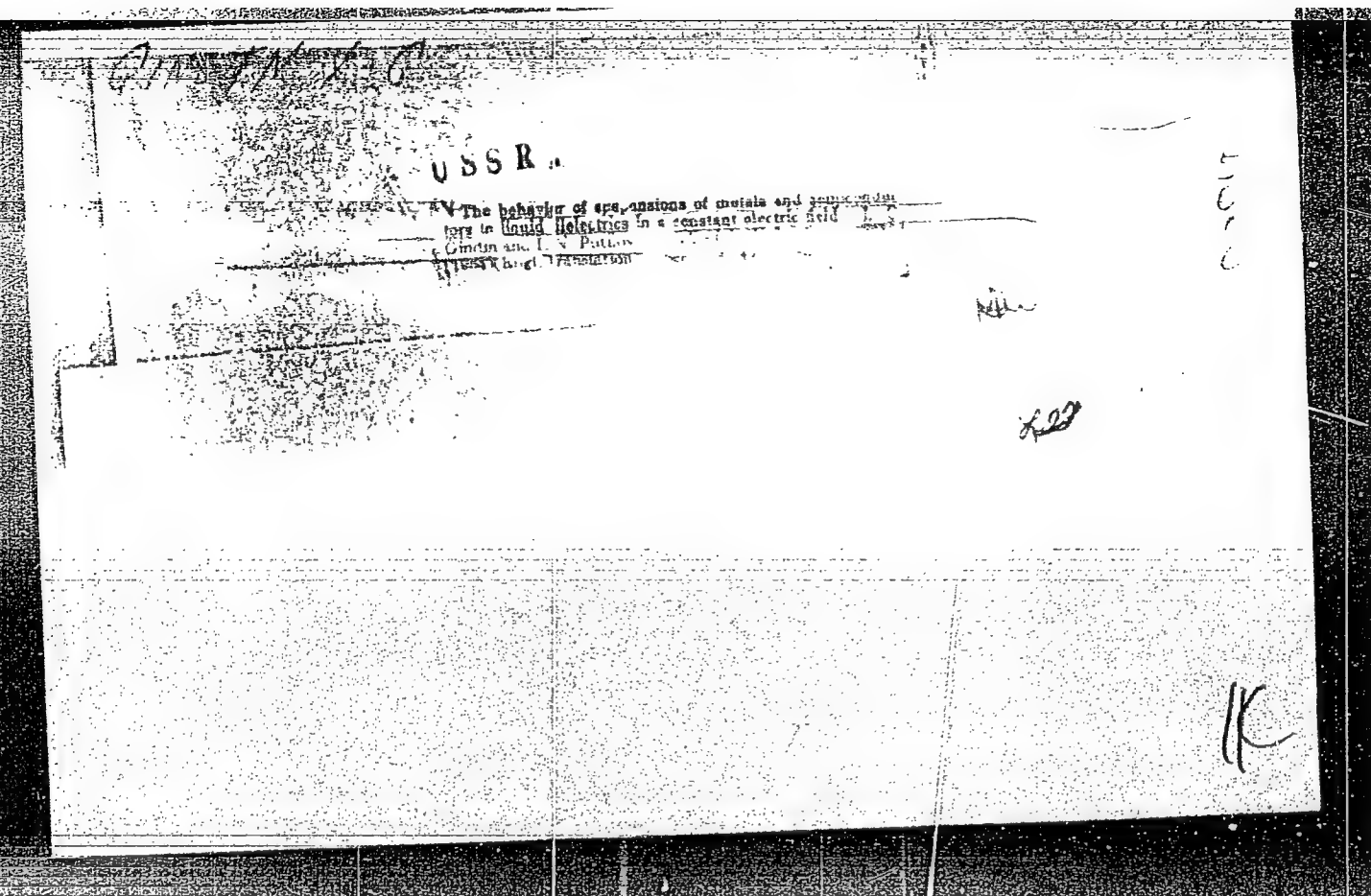electrochem. Presented by Acad P. A. Rebinder
28 Jun 52.

234T32

GINDIN, L.G.

Chemical Abst.
Vol. 48 No. 5
Mar. 10, 1954
Metallurgy and Metallography

Corrosion of steels by kerosine and methods of its inhibition. I. N. Putilova, L. G. Gindin, E. V. Artamonova, and V. A. Kazakova. Zhur. Prikiad. Khim. 26, 148-51(1953); cf. C.A. 30, 5166⁴.—Contrary to conclusions drawn from work on the corrosive action of gasoline and hydrocarbons (cf. C.A. 31, 4253⁴, 1750⁵; 33, 3740⁹) kerosine was found to be corrosive to steels. The rate of corrosion for kerosines, treated in different manners, in diminishing order, are as follows: kerosine (I no. 0.30); satd. with water; redistd.; treated with Na and satd. with H_2O; and treated with Na. The analysis of the products of corrosion were 90% Fe^{+++} salt of org. acids and 10% Fe_2O_3. This acid was more than the kerosine contained originally, and it continued to increase to 25 times its original content after the steel had been removed. This suggests induced autocatalytic oxidation of kerosine when in contact with steels, and shows that the rate of oxidation is greater than the rate of combination of acid formed with Fe. The addn. of a H_2O soln. of Na benzoate prevents corrosion in the water phase, but corrosion continues in the kerosine phase. Org. substances contg. Cl, S, NH_2, and OH are suggested as inhibitors (cf. C.A. 46, 6510b).   L. Bencowitz

USSR.

V The behavior of suspensions of metals and semiconductors in liquid dielectrics in a constant electric field.

Cindin and I. V. Putilov.

Russian Translation

GINDIN, L. G.

**2244   THE ACTION OF A CONSTANT ELECTRIC FIELD ON A
SUSPENSION OF METALS AND SEMICONDUCTORS IN LIQUID.**

The behaviour of 0.1% by weight suspensions of metal-coated
particles in aviation petrol. Pt showed high current conduction.

[illegible lines]

[illegible] particle the [illegible] coating
formed at high fields was stable on removing the applied voltage.
The high of Pt suspensions was attributed to the absence of
[illegible]

Gindin, L. G.

USSR *

The corrosion of metals by a saturated fuel. I. N. Puti- 62
lova, L. G. Gindin, and E. V. Artamonova. *Doklady Akad.
Nauk S.S.S.R.* 94, 489-92(1954); cf. *C.A.* 49, 4488h.—
The corrosion of the following metals and alloys in kerosine
was studied by noting the time for surface discoloration to
appear: Steel 1: C 0.19, Mn 0.43, Si 0.30, S 0.045, P 0.045,
Ni 0.30, Cr 0.30%.   Steel 2: C 0.40, Mn 0.05, Si 0.30,
S 0.045, P 0.045, Ni 0.30, Cr 0.30%.   Steel 3: C 1.60,
Mn 0.90, Si 0.30, Cr 1.10, W 1.52%.   Steel 4: C 0.99,
Mn 0.30, Si 0.35, S 0.02, P 0.027, Ni 0.37, Cr 1.45%.
Steel 5: C 0.30, Mn 0.75, Si 0.36, Ni 0.40, Cr 1.02%.
Mg: Fe 0.09%, traces of Si. Mg-1: Al 0.3, Mn 2.2,
Zn 0.3, Cu 0.05, Ni 0.01, Si 0.25, Be 0.02, Fe 0.04%.
Mg-2: Al 8.3, Mn 0.3, Zn 0.7, Cu 0.05, Ni 0.002, Si 0.2,
Be 0.02, Fe 0.04%. The kerosine was characterized by
distn. and by the following: d⁵⁰ 0.819; acidity 0.56 mg.
KOH; iodine no. 0.30; S content 0.05%; flash point ac-

OVER
②

I. N. PUTILOVA

cording to Martens-Penskil 36°. The kerosine was used as received (I), satd. with water (II); distd. (III); purified over Na (IV); purified over Na and then satd. with water (V). The best materials were steel 3 (lasting 70-6 days in I, 07-70 days in II, and 1 year with no corrosion in IV), and Mg and Mg-1 (no appearance of corrosion after 2 years in I, III, and IV). Steel 1 was the poorest (7-10 days in I) while steels 2, 4, 5 were nearly identical and intermediate between 1 and 3. Mg-2 lasted 35 days in I, 100 days in III, and 2 years in IV. Steel 1 and Mg-2 were also studied in two-phase mixts. of kerosine and water with and without Na benzoate (0.5 and 5%) in the water. Na benzoate lengthened the induction period in the aq. soln. and at the interface but only slightly in the kerosine. Thio, chloro, and amino derivs. of aliphatic and aromatic compds. were effective inhibitors for steel. These compds. were considered immunizers since corrosion did not appear for periods as long as one year.   R. D. Misch

Gindin, L. G.

Systematics of Inhibitors of the Corrosion of Metals. T. N. Putilova and L. G. Gindin (Zhur. Priklad. Khim., 1956, 29, (12), 1298-1301).—[In Russian]. P and G classify anti-corrosion substances into desctivators (which combine with H ions or dissolved O in aq. soln. and inhibitors (which have some surface affect). There are three types of inhibitor (1) inhibitors proper, which reduce the corrosion rate but do not prevent the attack proceeding to completion; (2) immunizors, which have little effect on the corrosion rate but which cause there to be an induction period before corrosion begins; and (3) passivators, which set up a passive film, thus preventing any further corrosion. Types (1) and (3) can each be divided into chem. and electrochem. groups, and the electrochem. groups can each be further subdivided into anodic, cathodic-anodic, and cathodic inhibitors.—G. V. E. T.

GINDIN, L.G.; MISKINOVA, T.A.; PUTILOVA, I.N.

Kinetics of the reactions of benzene solutions of certain fatty acids with sodium. Dokl.AN SSSR 106 no.4:683-686 F '56.(MIRA 9:6)

1.Predstavleno akademikom A.A.Balandinym.
(Acids, Fatty) (Sodium compounds)

GINDIN, L. G.

20-6-30/47

AUTHORS: Miskinova, T. A. , Gindin, L. G.

TITLE: The Kinetics of the Reactions of Sodium With Water and With the
Systems: Water - Dioxane, Water - Butyric Acid (Kinetika reaktsiy
natriya s vodoy i sistemami : voda - dioksan, voda - maslyanaya
kislota)

PERIODICAL: Doklady AN SSSR, 1957, Vol. 117, Nr 6, pp. 1027 - 1029 (USSR)

ABSTRACT: Before the investigation of the reaction of sodium with the systems
benzene - butyric acid - water it had to be determined how sodium
reacts with water alone and with the systems water - butyric acid.
The present paper gives the results of such investigations. Water
was diluted with dioxane which does not react with sodium at room
temperature. In the systems consisting of water and butyric acid
the butyric acid serves as "diluting medium" of water. The method
of the tests was already described in a preliminary paper by the
authors (reference 1). The experiments were made at 20°C. The com-
position of the systems studied is given. The reaction with pure
water was finished after several seconds. The data on the depen-
dence of the reaction velocity on the concentration of water in
the systems water - dioxane are illustrated by a diagram. In some
such systems the reaction velocity is a linear function of the
concentration of water and therefore satisfies a first order

Card 1/3

20-5-30/47

The Kinetics of the Reaction of Sodium With Water and With the Systems: Water -
- Dioxane , Water - Butyric Acid

equation of reaction: $dC/dt = kC$ with the constant $C = 4.7.10^{-5}$.
Above a certain concentration of wat er the reaction velocity ra-
pidly increases. Dioxane with water most probably forms a number
of oxone compounds by means of the hydrogen-linkages and thereby
inactivates water to the known degree. A further diagram illustrates
the dependence of the velocity of the dissolution of sodium in the
systems butyric acid-water on the portion of water in them. This
dependence has a peculiar steplike nature. These steps are in pa-
rallel with the abscissa and correspond to a certain interval of
the molecular relations between water and fatty acid within which
the dissolution velocity of sodium remains constant. These steps
are of different length and height. The reduction of the velocity
after the third step and the subsequent rapid acceleration of the
reaction also are peculiar. The peculiar nature of this reaction
may only be due to the common action of water and butyric acid
upon the metal. First of all water is supposed to react with so-
dium. But the assumption arises that butyric acid because of the
hydrogen-linkage forms a number of molecular compounds with water.
It is just this fact which might represent the key for the expla-
nation of the kinetic rules found here. There are 3 figures, 1
Card 2/3   table, and 3 references, 2 of which are Slavic.

20-6-30/47

The Kinetics of the Reactions of Sodium With Water and With the System: Water -
-, Dioxane, Water - Butyric Acid

PRESENTED: June 22, 1957, by P. A. Rebinder, Academician

SUBMITTED: June 5, 1957

AVAILABLE: Library of Congress

Card 3/3

S/044/62/000/005/056/072
C111/C444

AUTHOR: Gindin, L. O.

TITLE: On the controlling of chemical reactions

PERIODICAL: Referativnyy zhurnal, Matematika, no. 5, 1962, 56,
               abstract 5V301. ("Probl. kibernetiki", no. 5, M. Fizmatgiz,
               1961, 97-103)

TEXT: One points to the large dispersion of the results of certain
chemical experiments and to the processes of divergence and convergence
in connection with it. The latter ones are also observed in physics,
biology etc. The phenomena and analogies are considered under the
kibernetic aspect.

[Abstracter's note: Complete translation.]

Card 1/1

S/194/62/000/007/044/160
D295/D308

AUTHOR: Gindin, L.G.

TITLE: On the control of chemical reactions

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika
              no. 7, 1962, abstract 7-2-95 yu (In collection: Probl.
              kibernetiki, no. 5, 1961, 97 - 103)

TEXT: The fundamental problem of chemical kinetics is the develop-
ment of methods for the control of chemical reactions, enabling the
automation of production. The factors governing the course of a che-
mical process are divided into two groups: internal, material, and
external ones (temperature, pressure, radiation, mixing, etc.). Dis-
persion of experimental results, caused by the nature of the samp-
les tested, occurs in physical and physico-chemical investigations.
The methodological consequences of this are pointed out. Results of
the author's experiments are shown as well as examples from animate
nature, oecology and geology. The question is discussed of the need
of differentiating cybernetics into branches, in conformity with
the material nature of the systems investigated. The distinct featu-
Card 1/2

On the control of chemical reactions

S/194/62/000/007/044/160
D295/D308

res of chemical cybernetics are discussed. The close connection of chemical cybernetics and chemical kinetics is emphasized. [Abstractor's note: Complete translation.]

Card 2/2

GINDIN, L. G.; MISKINOVA, T. A.; PUTILOVA, I. N.

Reaction kinetics of sodium with the single-phase systems benzene-water-butyric (or lauric) acid. Zhur. fiz. khim. 36 no.12:2589-2592 D '62. (MIRA 16:1)

1. Moskovskiy elektrotekhnicheskiy institut svyazi.

(Butyric acid)   (Benzene)   (Sodium)

GINDIN, L.G.; MISKINOVA, T.A.

Kinetics of certain reactions involving metallic sodium. Kin.
i kat. 4 no.3:480-483 My-Je '63,   (MIRA 16:7)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut.
        (Sodium)   (Chemical reaction, Rate of)

MISKINOVA, T.A.; GINDIN, L.G.

Lead corrosion in dielectric materials. Zashch. met. 1 no.2:
195-198 Mr-Ap '65.   (MIRA 18:6)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut.

L 58283-65   EWT(1)/EWP(e)/EPA(s)-2/EWT(m)/EPR/EEC(t)/EWP(t)/EWP(k)/EWP(z)/EWP(b)
Pf-4/Ps-4/Pt-7/Pl-4   IJP(c)   JD/GG
ACCESSION NR: AP5015424   UR/0020/65/162/004/0839/0842

AUTHOR: Gindin, L. G.; Vol'pyan, A. Ye.; Galkin, I. F.; Gul', V. Ye.

TITLE: New data on the electrical breakdown of aluminum suspensions in dielectrics

SOURCE: AN SSSR. Doklady, v. 162, no. 4, 1965, 839-842

TOPIC TAGS: dielectric breakdown, aluminum suspension, aluminum dielectric,
aluminum oxide

ABSTRACT: To provide a phenomenological description of the process by which alu-
minum in suspensions is converted from a dielectric (due to its oxidized surface
layer) to a conductor, the authors took motion pictures of the principal stages of
this process. The pictures were taken continuously at the rate of one frame every
4 sec. The aluminum powder particles, ranging in size from fractions of one micron
to several microns (peak of distribution curve at 1 μ), were dispersed in B-70 avia-
tion gasoline. Aluminum powders impregnated with B-70 (into which the electrodes
were inserted) were also studied. Photographs representative of the principal
stages are illustrated and described. In addition, the authors investigated the
fundamental problems of the structure of the bridge formed by the aluminum particles
and the nature of the forces which form it and hold it together. To this end, oscil-

Card 1/3

L 58283-65
ACCESSION NR: AP5015424

lations of the current and voltage of the bridges were recorded, and the current-voltage characteristics of the bridge were plotted (see Fig. 1 of the Enclosure). The hysteresis loop arises from a structural rearrangement of the bridge. The observed deviations from Ohm's law were attributed to the evolutions of Joule heat. The results confirm an earlier hypothesis that the bonding between the individual links of the bridge is metallic and that when breakdown occurs the aluminum particles are welded to one another. Furthermore, the oscillograms indicate that when the current passes through the bridge, a major part is played by the forces of the electric field which continuously restore the broken contact between the links of the bridge and give it a degree of stability. Orig. art. has: 2 figures, 2 tables, and 3 formulas.   [08]

ASSOCIATION: none

SUBMITTED: 18Dec64   ENCL: 01   SUB CODE: IC, EM

NO REF SOV: 003   OTHER: 002   ATD PRESS: 4037

Card   2/3

L 58283-65
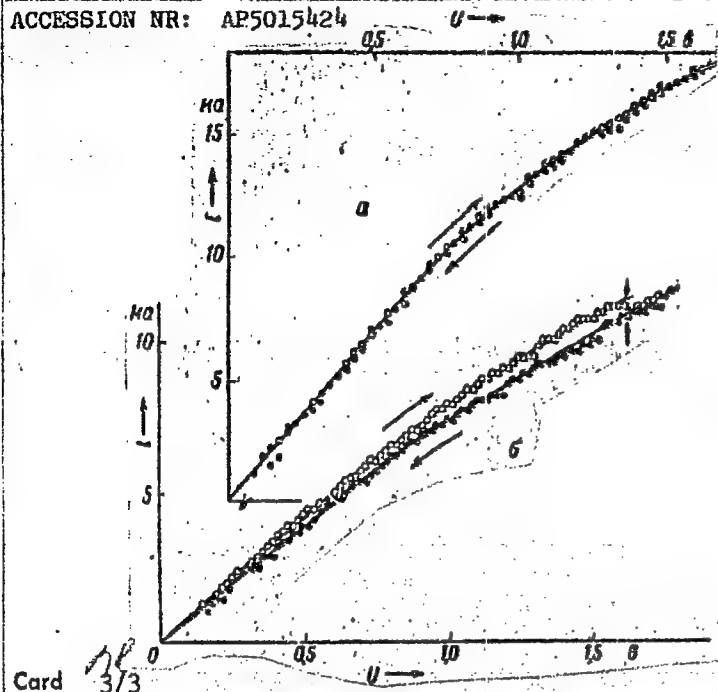ACCESSION NR: AP5015424   ENCLOSURE: 01

Fig. 1. Current-voltage
characteristics of alu-
minum bridges

a - Without hysteresis
loop; b - with hysteresis
loop.

Card   3/3

ZHIL'TSOVA, V.M.; KRUGLYAKOVA, K.Ye.; ULANOV, B.P.; GINDIN, L.G.

Kinetics of DNA denaturation following ultraviolet irradiation.
Dokl. AN SSSR 164 no.1:198-200 S '65.   (MIRA 18:9)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut i Institut
khimicheskoy fiziki AN SSSR. Submitted March 25, 1965.

BALANDIN, A.A.; GINDIN, L.G.

Kinetics of antibacterial reactions. Report No.1. Effect of some organotin compounds on pathogenic bacteria. Biofizika 10 no.6:986-992 '65.   (MIRA 19:1)

1. Vsesoyuznyy zaochnyy politekhnicheskiy institut, Moskva.
Submitted March 23, 1965.

L 21191-66   EWT(1)/EWP(e)/EWT(m)/EWP(t)/EWP(k)   IJP(c)   JD
ACC NR: AP6008052   SOURCE CODE: UR/0020/66/166/004/0894/0896

AUTHOR: Vol'pyan, A. Ye.; Gindin, L. G.; Gul', V. Ye.

ORG: All-Union Correspondence Polytechnic Institute (Vsesoyuznyy zaochnyy politekhnicheskiy institut)

TITLE: Behavior of copper suspensions and powders in a constant electric field

SOURCE: AN SSSR. Doklady, v. 166, no. 4, 1966, 894-896

TOPIC TAGS: copper, electric conductivity, powder metal property, semiconducting film

ABSTRACT: Powdered electrolyte copper particles (2-15 µ) oxidized in air and covered with a film of semiconducting Cu_2O were suspended in B-70 airplane gasoline and the conductivity of the suspension in a constant electric field was studied. The volt-ampere characteristic obtained showed that the conductivity of the system increases smoothly with the field strength as is typical of semiconductors in strong electric fields. The conductivity was due to the contact between the individual

UDC: 54.148

Card 1/2

L 21191-66
ACC NR: AP6008052 O

copper particles coated with Cu_2O. The critical voltage (value at which breakdown
occurs) was found to be directly proportional to the thickness of the oxide film.
This relationship can be used in rapid methods for determining the degree of oxida-
tion of metal powders. In order to show that the conducting structures in powders
do not differ from those observed in suspensions, the conductivity of copper powder
immersed in gasoline was studied as a function of the depth of immersion of the
electrodes; the volume of powder between the electrodes was proportional to the
depth. It was found that the conductivity of the oxidized copper powder before
breakdown and that of deoxidized copper powder is approximately proportional to the
immersion depth whereas the conductivity of oxidized powder after breakdown is in-
dependent of the volume of powder between the electrodes. Hence, in the first and
second case three-dimensional conducting structures are formed, but in the third
case, a bridge is produced. The paper was presented by Academician A. A. Balandin
on 6 July 1965. Orig. art. has: 3 figures.

SUB CODE: 11/   SUBM DATE: 05Jul65/   ORIG REF: 006/   OTH REF: 000

Card 2/2

L 03130-07   EWP(k)/EWP(m)/EWP(c)/EWP(w)/EWP(t)/ETI   IJP(c)   WE/DS/WW/JD/HW/JG

ACC NR: AP6027736   SOURCE CODE: UR/0020/66/169/004/0865/0867

AUTHOR: Gindin, L. G.; Vol'pyan, A. Yo.; Galkin, I. F.

ORG: All-Union Correspondence Polytechnic Institute (Vsesoyuznyy zaochnyy politekhnicheskiy institut)

TITLE: Structuralization of suspensions and powders of certain metals in a constant electric field

SOURCE: AN SSSR, Doklady, v. 169, no. 4, 1966, 865-867

TOPIC TAGS: powder metal, dielectric breakdown, ELECTRIC FIELD, ELECTRIC CONDUCTIVITY

ABSTRACT: Suspensions in gasoline (B-70) and gasoline-immersed powders of Fe, Ni, Co, Cr, Mo, W, Sb, Bi, Sn, Pb and Ag were studied in a constant electric field. All the metal particles were oxidized as a result of prolonged contact with air. On the basis of the behavior of their disperse systems, the metals studied are divided into four groups: (1) Pb, Bi; (2) Fe, Co, Ni, Cr, W, Mo; (3) Sn, Zn; (4) Ag, Sb. The differences between the first three groups are shown in Fig. 1, where the first group is represented by lead. The conductivity of lead up to the breakdown was too low to be measured, and became high only after the breakdown (indicated by a broken line). The second group is represented by Fe and Co, whose structures in relatively weak fields (up to the breakdown) display a conductivity obeying Ohm's law, and as the field increases, a conductivity characteristic of thin semiconducting films in strong fields.

Card 1/3   UDC: 54-148

L 05130-67

ACC NR: AP6027736   1

Breakdown occurs after $E > E_{or}$ is reached. The third group is characterized by a still greater increase of conductivity with rising E; whereas in Fe and Co the currents preceding the breakdown are 10^{-6} A, they amount to $\sim 10^{-3}$ A in Zn and Sn. In general, the behavior of suspensions and powders of the metals studied is determined by the nature and primarily by the conductivity of their oxide films. The formation of structures in the electric field is due to polarization forces of the particles, this polar-

Fig. 1. Volt-ampere characteristics of structures in Pb, Fe, Co, Zn and Sn powders (broken lines indicate breakdown leading to the formation of a bridge).
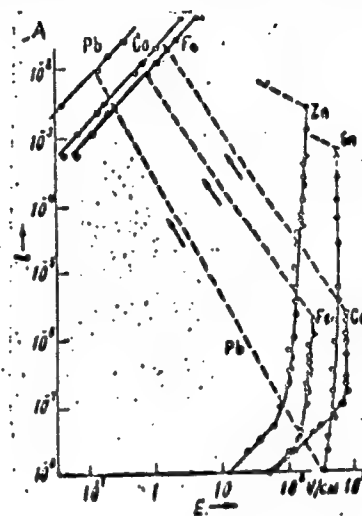
ACC NR: AP6027736

ination in turn being related to the conductivity of the surface oxides. A conductiv-
ity low enough to promote the formation of more or less stable structures up to the
breakdown is shown by oxides of the metals of the first three groups. The paper was
presented by Academician Robinder, P. A., 11 Dec 65. Authors thank Prof. V. Yo. Gul'
for his steady interest in this work and for discussing its results. Orig. art. has
2 figures.

SUB CODE: 07,11,20/ SUBM DATE: 04Oct65/ ORIG REF: 010/ OTH REF: 004

Card 3/3

GINDIN, L. M.   PA 11^{T}70

USSR/Chemistry - Polymerization. -   . .. Apr 1947
     Chemistry - Azeotropes

"Some Problems of Binary Copolymerization," L. M.
Gindin, A. D. Abkin, A. S. Medvedev, 4 pp

"CR Acad Sci" Vol LVI, No 2

Differential equations and their solutions, describ-
ing the subject phenomenon. Study of azeotropic
(extremal boiling point) mixtures and the limits to
polymerization.

                                                11T70

AUTHORS: Gindin, L. M., and Kouba, E. F.

TITLE: Quick Detection of Nickel by the Extraction Method (Ekspressnoye opredeleniye Nikelya ekstraktsionnym metodom)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol. 23, No. 1, pp. 19-20 (U.S.S.R.)

ABSTRACT: This process is based on the premise that the detection of nickel in hydroxide, oxide and metallic cobalt can be effected only after the removal of the cobalt. Cobalt is generally precipitated in the form of potassium cobaltinitrite. The final detection is done by the gravimetric or colorimetric method. The experimenters tried the method based on the difference in solubility of nickel dimethyl-glyoximate and cobalt in chloroform and found that the analysis took about 30 minutes. The analysis was begun by dissolving a batch of hydroxide or oxide of cobalt in a concentrated saline acid (metallic cobalt dissolved in nitric acid 1:1). The further steps of the analysis are stated, a table of results is prepared and it is found that the extraction method gives results close to those of the spectral method.

Card 1/2

Quick Detection of Nickel by the Extraction Method

ASSOCIATION: Noril Mining and Metallurgical Combine

PRESENTED BY:

SUBMITTED:

AVAILABLE:

Card 2/2

Gindin, L.M.

4E2C
4E4j

2980. **Rapid determination of iron in products of the cobalt industry by means of extraction.** L. M. Gindin and E. F. Kouba (Norilsk Mining-Metallurgy Combine). *Zavod. Lab.*, 1957, 23 (2), 150–151 — The soln. (20 ml) of cobalt salts is mixed with 30 ml of conc. HCl in a separating funnel and shaken for 15 to 10 sec. with 25 ml of isoamyl acetate. The solvent layer containing the Fe is shaken with 25 ml of water, which extracts the Fe. Iron is determined colorimetrically with sulphosalicylic acid against an artificial scale of standards containing $FeCl_3$, $CoSO_4$ and HCl. With high contents of Co, several extractions may be necessary.

G. S. Smith

SOV/20-122-3-34/57

AUTHORS: Gindin, L. M., Bobikov, P. I., Kouba, E. F., Kopp, I. F., Rozen,
             A. M., Ter-Oganesov, N. A., Zagarskaya, N. I.

TITLE: Separation of Metals by the Exchange-Extraction Method
   (Razdeleniye metallov metodom obmennoy ekstraktsii)

ABSTRACT: An extraction in connection with an exchange reaction between
             metals is a very productive method of separation if these metals
             are in different phases: in an organic phase as salts and ali-
             phatic acids and in an aqueous phase as salts of mineral acids
             (Ref 1). For this purpose saturated aliphatic acids with 5 and
             more carbon atoms were used. They fulfill a double function:
             a) they take part in the formation of the corresponding metallic
             salts (soaps), and b) they serve as solvents for these soaps
             being formed. Aliphatic acids are used most properly as solu-
             tions in an inactive solvent with a low specific weight. Direc-
             tions for the preparation of such solutions are mentioned. The
             exchange reaction between the metals as mentioned earlier can be
Card 1/3   expressed by the following equation:

Separation of Metals by the Exchange-Extraction Method   SOV/20-122-3-34/57

$$(^1Me^{2+})_{aqu} + (^2MeR_2)_{org} \longrightarrow (^1MeR_2)_{org} + (^2Me^{2+})_{aqu}; \qquad (1)$$
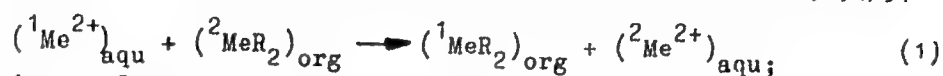
^1M and ^2M denote the corresponding metals, R - the organic res-
idue of the aliphatic acid $C_nH_{2n+1}COO'$, the indices org and aqu
denote the organic and the aqueous phase. The equilibrium con-
stant of the exchange reaction depends on the character of the
exchanging metals, as was confirmed by the experiments. Metals
with a small pH value ("acid" metals) mainly pass into the or-
ganic phase, metals with a high pH value, however, (more alka-
line metals) into the aqueous phase. In many cases reaction (1)
takes place almost completely ($>99\%$). it may therefore be said
that a metal is displaced from the organic phase by another
metal. Separation of the metallic salts by means of the reaction
mentioned in the title can be carried out from the aqueous as
well as from the organic phase. In the first case (Fig 1) the
aqueous phase which contains a mixture of salts of two metals
is brought into contact with the organic phase in which a salt
of an aliphatic acid of a stronger alkaline metal is contained.
In the second case the organic phase which contains a mixture
of salts of the aliphatic acids is brought into contact with the
aqueous phase which contains a salt of a mineral acid of a

Card 2/3

Separation of Metals by the Exchange-Extraction Method   SOV/20-122-5-54/57

weaker alkaline metal. Table 1 reveals the results of separation
of metallic salts combined with sulfuric acid by means of the
discussed method. As organic phase a solvent of industrial
aliphatic acids of the fraction $C_7 - C_9$ (average molecular
weight 141) in petroleum (400 g/liter) was used. Data on table 1
characterize a single exchange. By using an extraction column
the degree of separation is considerably increased. If metals
have similar properties reaction takes place incompletely.
There are 2 figures, 1 table, and 1 reference, 1 of which is
Soviet.

ASSOCIATION: Noril'skiy gorno-metallurgicheskiy kombinat im. A. P.
Zavenyagina (Noril'sk Mining Metallurgy Kombinat imeni A. P.
Zavenyagin)

PRESENTED: May 4, 1958, by S. I. Vol'fkovich, Member, Academy of Sciences,
USSR

SUBMITTED: April 12, 1958

Card 3/3

5(2,3,4)   SOV/20-128-2-20/59
AUTHORS: Gindin, L. M., Bobikov, P. I., Rozen, A. M.

TITLE: Some Physico-chemical Peculiarities of the Exchange Extraction

ABSTRACT: The exchange extraction is based on reactions proceeding
              between the salts of fatty acids (soaps), which are mainly dis-
              solved in the organic phase, and the salts of mineral acids dis-
              solved in the aqueous phase (Ref 1). Besides the above-mention-
              ed reaction (1), its equilibrium constant K (2) as well as the
              equilibrium conditions for metal soaps (3) are indicated
              (K_1 and K_2). The soaps are not dissociated in the organic

              phase, but they are dissociated in the aqueous phase. In the
              exchange reaction, the equilibrium conditions of the equations
              of both soaps must be satisfied at the same time. A common
              solution of the two equations (3) gives the value of K_1/K_2 (4).

              From (2) and (4) it results that $K = K_1/K_2$, i.e. the equilibrium
Card 1/4   constant of the exchange reaction is equal to the ratio of the

SOV/20-128-2-20/59

Some Physico-chemical Peculiarities of the Exchange Extraction

distribution constants of the mutually exchanging metals. Thus the direction of the exchange reactions is conditioned by the distribution character of the corresponding soaps. The metals, the soaps of which are less soluble in water, pass into the organic phase, mainly as soaps. Metals with a higher water solubility of their soaps are concentrated in the aqueous phase as cations. With respect to the rising water solubility of their soaps, the metals constitute the following sequence: Fe^{III}, Pb^{II}, Cu^{II}, Zn, Ni^{II}, Co^{II}, Mn^{II}, Na; the same order is maintained in the exchange reactions: each metal, which is present as a cation in the aqueous phase, dislodges all metals on its right in the sequence out of the soap dissolved in the organic phase. The extraction of the metal by the organic phase can be achieved by the introduction of an alkali into the system. Figure 1 shows the experimental results characterizing the extraction of Cu^{II}, Zn, Ni^{II}, and Co^{II} by a fatty acid (fraction C_7-C_9 dissolved in petroleum, concentration of the acid 400 g/l) under the influence of NaOH. This shows that the

Card 2/4

SOV/20-128-2-20/59

Some Physico-chemical Peculiarities of the Exchange Extraction

equation $\lg \alpha = K_6 + 2$ pH (11) derived from the above-mention-
ed equations is satisfied. With an increase in the basic
properties of the metals, the value of the constant K_6 decreases,
while the above-mentioned sequence of metals is maintained. It
is easy to prove that for metals of equal valency the constant
(1) is determined by the constants K_{Me-H} characterizing the
extraction of each metal mutually exchanging under the influ-
ence of the base. After further calculations ((12) - (20)),
the authors arrive at the conclusion that the solubility of
the soap in the aqueous phase is proportional to the cube root
of the solubility product of the metal hydroxide. This explains
the connection between the behavior of a metal during the ex-
traction by fatty acids, and its basicity. The separation of
metals by exchange extraction constitutes a peculiar hydrolytic
method of separation: this separation is distinguished from the
ordinary hydrolytic method by the absence of precipitation.
As is well intelligible, this separation proceeds more perfect-
ly since there is no carrying along by the solid phase. Be-

Card 3/4

SOV/20-128-2-20/59

Some Physico-chemical Peculiarities of the Exchange Extraction

sides, a multi-stage separation in counterflow columns is easier
to be carried out. Therefore, this kind of extraction makes
possible the separation of metals with similar properties
(e.g. $Co^{II} - Ni^{II}$) which cannot be achieved by means of hydro-
lytic separation. Figure 2 shows the dependence of the
$lg(Me^{+2})b$ on pH in the distribution of soaps. There are
2 figures and 4 references, 2 of which are Soviet.

ASSOCIATION: Noril'skiy gornometallurgicheskiy kombinat im. A. P.
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                A. P. Zavenyagin)

PRESENTED: April 6, 1959, by I. I. Chernyayev, Academician

SUBMITTED: March 30, 1959

Card 4/4

GINDIN, L.M.

Extraction of hydrochloric acid and calcium chloride with
isoamyl alcohol. Zhur.neorg.khim. 5 no.1:139-148 Ja '60.
(MIRA 13:5)

1. Noril'skiy gorno-metallurgicheskiy kombinat im. A.P.
Zavenyagina. Opytno-issledovatel'skiy tsekh.
      (Hydrocholoric acid) (Calcium chloride)
            (Isopentyl alcohol)

GINDIN, L.M.; KOPP, I.F.; ROZEN, A.M.; BOBIKOV, P.I.; KOUBA, E.F.;
TER-OGANESOV, N.A.

Extraction equilibria for cobalt, nickel, and certain metals.
Zhur.neorg.khim. 5 no.1:149-159 Ja '60.

(MIRA 13:5)

1. Noril'skiy gornometallurgicheskiy kombinat im. A.P.
Zavenyagina. Opytno-issledovatel'skiy tsekh.
        (Extraction (Chemistry)) (Metals)

GINDIN, L.M.; BOBIKOV, P.I.; KOUBA, E.F.; BUGAYEVA, A.V.

Separation of metals by exchange extraction with fatty acids under
the influence of alkali. Zhur. neorg. khim. 5 no.8:1868-1875 Ag
'60.   (MIRA 13:9)

1. Noril'skiy gornometallurgicheskiy kombinat im.A.P.Zavenyagina.
        (Acids, Fatty)   (Metals—Analysis) (Extraction (Chemistry))

GINDIN, L.M.; BOBIKOV, P.I.; KOUBA, E.F.; BUGAYEVA, A.V.

Distribution of metal soaps in exchange extraction.   Zhur. neorg.
khim. 5 no.10:2366-2373 O '60.   (MIRA 13:10)

1. Noril'skiy gornometallurgicheskiy kombinat im.A.P.Zavenyagina.
        (Soap)   (Extraction (Chemistry))

GINDIN, L.M.; BOBIKOV, P.I.; KOUBA, E.F.

Extraction of metals of the platinum group with amines.
Izv. Sib. otd. AN SSSR no.10:84-91 '61.   (MIRA 14:12)

1. Noril'skiy gornometallurgicheskiy kombinat imeni A.P.
Zavenyagina.
                    (PLATINUM GROUP)
                    (EXTRACTION(CHEMISTRY))
                    (AMINES)

18.3100

31739
S/136/61/000/012/001/006
E091/E335

AUTHORS: Gindin, L.M., Bobikov, P.I., Patyukov, G.M.,
Dar'yal'skiy, V.A., Brodnitskiy, K.P. and Kasavin, I.A.

TITLE: Electrolytic-extraction method for the production of
high-purity cobalt

PERIODICAL: Tsvetnyye metally, no. 12, 1961, 22 - 26

TEXT: The basic method for the production of high-purity
cobalt is its purification from other metals by double
extraction and the final electrolytic separation of the metallic
cobalt. Cobalt is separated from less alkaline metals during
double extraction and, subsequently, it is separated from more
alkaline ones, which plate out at the cathode to a certain extent,
by electrodeposition. In the above technological scheme, an
ion-exchange separation from Pb and Zn is used, in addition to
the double-extraction purification of cobalt solutions. However,
variations of this scheme are possible in which only extraction-
purification without ion exchange is carried out. This method is
based on the double reactions between metals in different phases:
in the organic phase, in the form of fatty acid salts (soap) and
Card 1/3

31739
S/136/61/000/012/001/006
Electrolytic-extraction method ... E091/E335

in the aqueous phase, in the form of mineral acid salts
(chlorides or sulphates). Fatty acids of the C_7-C_9 fraction
(monocarbonic acids of the aliphtic series) are used in the
organic phase; these participate in the formation of the
corresponding metal salts and are also solvents for the soaps
formed. The principles underlying this method are discussed
and the procedure is outlined. The method has many advantages
over the double extraction-electrolytic one. The following are
the main advantages: 1) the purification of the Co solution
from impurities is completely automated and mechanized;
2) filtration of solid cakes and operations associated with
processing and unloading are dispensed with;
3) the extraction of Co is higher and the losses lower;
4) compared with the normal hydrometallurgical process, this
method of Co-production results in a higher quality metal;
5) purification is carried out at normal temperature and
pressure;

Card 2/3

31739
S/136/61/000/012/001/006
Electrolytic-extraction method .. E091/E335

6) working conditions are healthier;
7) production costs are lower.

There are 1 figure, 1 table and 4 Soviet-bloc references.

X

Card 3/3